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### Education

M.S. - Mining and Minerals Engineering (Environmental Track), Virginia Polytechnic Institute and State University, 2016

B.S. - Mining and Minerals Engineering, Virginia Polytechnic Institute and State University, 2015

### Professional Licenses

Professional Engineer - VA

### Professional Affiliations

Solid Waste Association of North America

Society of Mining, Metallurgy, and Exploration

### Professional Experience

As a Project Engineer, Ms. Essex is responsible for providing engineering support to landfill gas (LFG) engineering, air permitting, landfill engineering, solid waste facility design, stormwater management, and mining engineering projects. Since joining SCS in 2016, her expertise in air emissions compliance, air permitting, landfill design and permitting, LFG system design, and mining engineering has allowed her to successfully provide these services for municipal and private clients. Representative examples of her project experience include the following:

Air Emissions Compliance

**Chester, Virginia, Shoosmith Sanitary Landfill.** Project Engineer responsible for preparing an updated landfill gas collection and control system (GCCS) Design Plan as required by new air regulations.

**Stafford, Virginia, R-Board Sanitary Landfill.** Project Manager responsible for development of Semi-Annual Title V Reports, Annual Compliance Certification documents, Annual Emissions Statements/Annual Update Reports, and annual Greenhouse Gas (GHG) Reports. Additional activities consist of assistance with Air Quality Permit renewal, performing emissions calculations, analyzing LFG wellfield data, and providing compliance-related notifications to regulators.

**Virginia Beach, Virginia, Virginia Beach Landfill No. 2.** Project Engineer support for air permit compliance related to diesel pump engines.

**Waste Management of Virginia.**  Project Engineer responsible for preparing updated landfill gas collection and control system (GCCS) Design Plans for three Virginia landfill facilities as required by new air regulations.

**Winston-Salem, North Carolina, Hanes Mill Road Landfill.** Project Engineer responsible for development of Semi-Annual Title V Reports, Annual Emission Inventories, and Annual Compliance Certification documents. Additional activities consist of preparing an updated GCCS Design Plan, Air Quality Permit renewal, performing emissions calculations, analyzing LFG wellfield data, and development of an LFG recovery projections and economic analysis of gas-to-energy project report, including pro forma scenario modeling.

Air Permitting

**Charles City, Virginia, Charles City County Landfill.**  Project Manager responsible for LFG modelling and preparation of application documents for Stationary Source Permit modification and Title V Permit renewal.

**Chesapeake, Virginia, Total Fiber Recovery.**  Project Manager responsible for performing emission calculations and preparing a Stationary Source Permit Application for a proposed recycled pulp facility.

**Chester, Virginia, Shoosmith Sanitary Landfill.**  Project Engineer responsible for LFG modelling and preparation of application documents for Stationary Source Permit modification and Title V Permit renewal.

**Dublin, Virginia, Cloyd’s Mountain Landfill**. Staff Engineer responsible for performing emissions calculations for insignificant emission units for Title V Permit Renewal, reviewing draft Title V Permit documents, and preparing documentation for an administrative amendment for Title V Permit design capacity.

**Henrico County, Virginia, Henrico County Public Schools.** Project Manager responsible for performing research and calculations to determine air permitting applicability for the Henrico County Public Schools Construction and Maintenance Carpentry Shop’s spray booth. By performing Potential to Emit calculations based on maximum operating hours of the Carpentry Shop, SCS was able to achieve air permitting exemption for the spray booth in the form of an authorized letter from VDEQ.

**Spotsylvania County, Virginia, Livingston Sanitary Landfill.** Project Engineer responsible for performing emissions calculations and preparing an application for a stationary source air permit in response to a major Solid Waste Permit amendment. Additional activities involved updating the facility’s Landfill Gas Management Plan, preparing an Amended Design Capacity Report, and preparing a Tier I NMOC Report.

**Spotsylvania County, Virginia, Spotsylvania County Utilities.** Project Manager responsible for determining RICE NESHAP and NSPS applicability for the Motts Run Water Treatment Plant’s emergency generator entering a power demand response program. Specific activities involved researching air permitting regulations related to this activity, preparing preliminary emissions calculations, and providing the County with SCS’s determination that air permitting would be required.

**Raleigh, North Carolina, North Wake County Landfill**. Project Engineer responsible for performing emissions calculations and preparing documentation for a minor amendment to the Title V Permit to replace an existing flare with a new unit.

Virginia Beach, Virginia, Virginia Beach Landfill No. 2. Project Engineer support for reviewing draft Title V and Stationary Source Air Permits, Annual Emission Statements, NSPS semi-annual reports, and emissions calculations. Prepared emissions calculations for emergency generators for Title V Permit Modification and Minor NSR Permit Applications and achieved termination of the facility's State Operating Permit.

Landfill Design and Permitting

**Bedford County, Virginia, Bedford County Landfill.** Staff Engineer responsible for site design and grading of four future phases of landfill expansion for a major solid waste permit amendment. Specific activities involved designing base, intermediate, and final grades; balancing cut and fill material; designing facility roads and ditches; performing airspace volume calculations; phasing landfill cells and stockpiles; and designing leachate management infrastructure.

**Blue Ridge Resource Authority Landfill, Virginia.** Project Engineer support for final closure site grading design for a major Solid Waste Permit amendment.

**Chester, Virginia, Shoosmith Sanitary Landfill.** Staff Engineer with experience preparing construction drawings for landfill expansion and performing construction quality assurance for new cell construction as well as final cover installation for landfill closure. Other responsibilities have included performing volume calculations and designing final grading contours to help the facility realize additional airspace.

**Dumfries, Virginia, Possum Point Power Station.** Staff Engineer responsible for developing bid documents and construction drawings for a landfill slope stabilization project. Specific activities include preparing technical specifications, performing stormwater calculations, grading portions of the site, and preparing forms for site permitting efforts. Additional efforts have included detailed project scheduling.

Landfill Gas Design

**Campbell County, Virginia, Region 2000 Regional Landfill – Livestock Road Facility.** Project Engineer responsible for preparing an Initial Visible Emissions Evaluation test protocol and scheduling a test date with VDEQ. Other work has consisted of reviewing draft Title V Permit documents; developing construction drawings, well schedule, and construction cost estimates for an LFG system expansion project; and modeling landfill gas generation and collection rates for a potential LFG to energy project.

**Chester, Virginia, Shoosmith Sanitary Landfill.** Project Engineer responsible for designing and developing construction drawings for a LFG system large-diameter perimeter header and series of condensate sumps; assisted with field questions during construction activities.

**Lawrenceville, Virginia, Brunswick Waste Management Facility.** Project Manager responsible for development of full design packages for the annual phased expansion of the LFG collection and control system. Specific activities involve development of schedules for LFG extraction wells and pumps; design of pump stations and condensate sumps; layout and selection of LFG collection, air, and force main piping and valves; and project budgeting.

Mining Engineering

**Stony Creek, Virginia, Iluka Resources.** Project Manager responsible for providing mining engineering support for rehabilitation and closure for two mine sites. Specific activities involved pit and cap designs for discrete rehabilitation areas; landform evolution modeling; detailed project scheduling and planning based on material movement quantities, distances, and equipment availability; balancing cut and fill material; sizing and grading sediment ponds; and performing volume calculations.

Stormwater Management

**Henrico County, Virginia, Pyramid Network Services.** Staff Engineer responsible for stormwater and erosion and sediment control planning for seven emergency communications tower sites. Specific activities involved development of stormwater management plans, erosion and sediment control plans, grading plans, and best management practice sizing and design.

### Publications/Presentations

Essex, V., Nachman, L., and Einsmann, M., “Case Studies and Lessons Learned Related to New Landfill Air Regulations,” VRA + SWANA Sharing Solutions Conference, May 5, 2022.

Johann-Essex, V., Keles, C., Rezaee, M., Scaggs-Witte, M., Sarver, E., “Respirable coal mine dust characteristics in samples collected in central and northern Appalachia”, International Journal of Coal Geology, September 2017.

Johann-Essex, V., Keles, C., Sarver, E., “A Computer-Controlled SEM-EDX Routine for Characterizing Respirable Coal Mine Dust”, Minerals, January 2017.

Johann, V. A., “Development and Implementation of an Automated SEM-EDX Routine for Characterizing Respirable Coal Mine Dust”, Master’s Thesis, Virginia Polytechnic Institute and State University, November 2016.

Johann, V. A. and Sarver, E. A., “Considerations for an Automated SEM-EDX Routine for Characterizing Respirable Coal Mine Dust”, 15th North American Mine Ventilation Symposium Proceedings, June 2015.